

CLAIMS:

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Cl 1. An impact reduction vehicle bumper system for a vehicle for reducing the force upon impact with an object comprising:

- at least two frame rails mounted on the vehicle body;
- at least two brackets coupled respectively to the at least two frame rails;
- a beam attached to the at least two brackets;
- a plate member attached to the beam; and
- at least two frame rail extensions coupled to the at least two brackets.

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2 2. The impact reduction vehicle bumper system according to claim 1, wherein the plate member is composed of mild steel and is welded to the beam.

3. The impact reduction vehicle bumper system according to claim 1, wherein the beam and brackets are composed of high strength steel and the beam is welded to the brackets.

4. The impact reduction vehicle bumper system according to claim 1, wherein the frame rail extensions are composed of a mild steel and are welded to the brackets.

5. The impact reduction vehicle bumper system according to claim 4, wherein the brackets are side brackets.

6. The impact reduction vehicle bumper system according to claim 1, wherein the plate member has a U-shaped cross-section.

7. The impact reduction vehicle bumper system according to claim 6, wherein the plate member has a multi -step U-shaped cross-section.

8. The impact reduction vehicle bumper system according to claim 7, wherein the multi-step U-shaped cross-section is a three -step U-shaped cross-section.

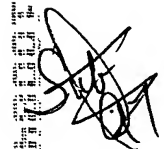
9. The impact reduction vehicle bumper system according to claim 1, wherein frame rail extensions include an upper extension, a lower extension and an inner extension.

10. The impact reduction vehicle bumper system according to claim 9, wherein the upper and lower extensions form an angled box and the inner extension is disposed between the upper and lower extensions.

11. The impact reduction vehicle bumper system according to claim 1, wherein a peak force of the object on the vehicle bumper system is less than 7.5 kN.

12. The impact reduction vehicle bumper system according to claim 1, wherein a peak moment of the object on the vehicle bumper system is less than 510 Nm.

13. The impact reduction vehicle bumper system according to claim 1, wherein the impact reduction system is a vehicle front bumper.

 14. The impact reduction vehicle bumper system according to claim 13, wherein the vehicle front bumper is mounted on a vehicle that meets ride height and fascia angle requirements for an alternative upper legform impactor test.